Town Center Streetscape Project

Lexington, MA

Intersection Locations:

Massachusetts Avenue @ Woburn Street
Massachusetts Avenue @ Edison Way
Massachusetts @ Waltham Street

Board of Selectmen Meeting
May 11, 2015

Project Limits

Project Goals

1. Improve safety for all modes of travel
2. Traffic Calming (Reduce Speed)
3. Bicycle accommodation throughout Project
4. No degradation of Level of Service (LOS)
5. No change in traffic patterns

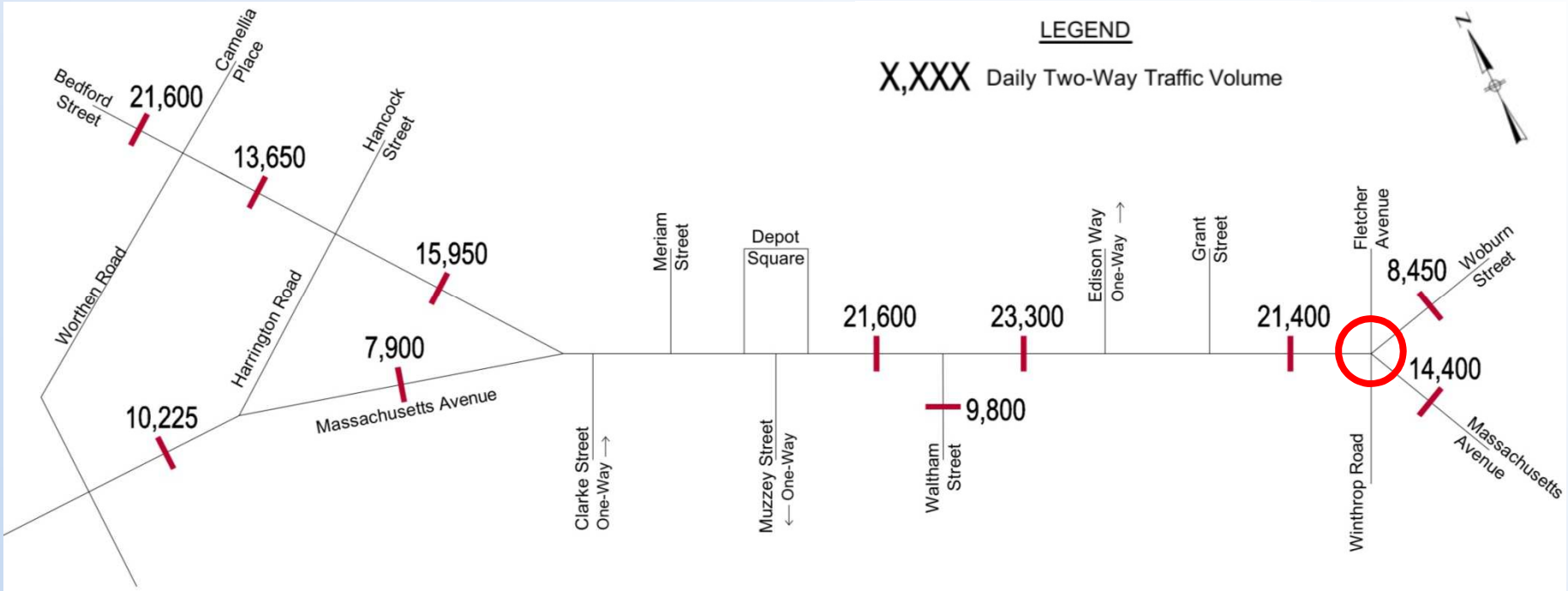
Discussion Points

1. Traffic Data (Volume and Speed)
2. Existing Deficiencies
3. Accident/Safety Analysis
4. Traffic Signal Warrant Analysis
5. Improvement Option Evaluation

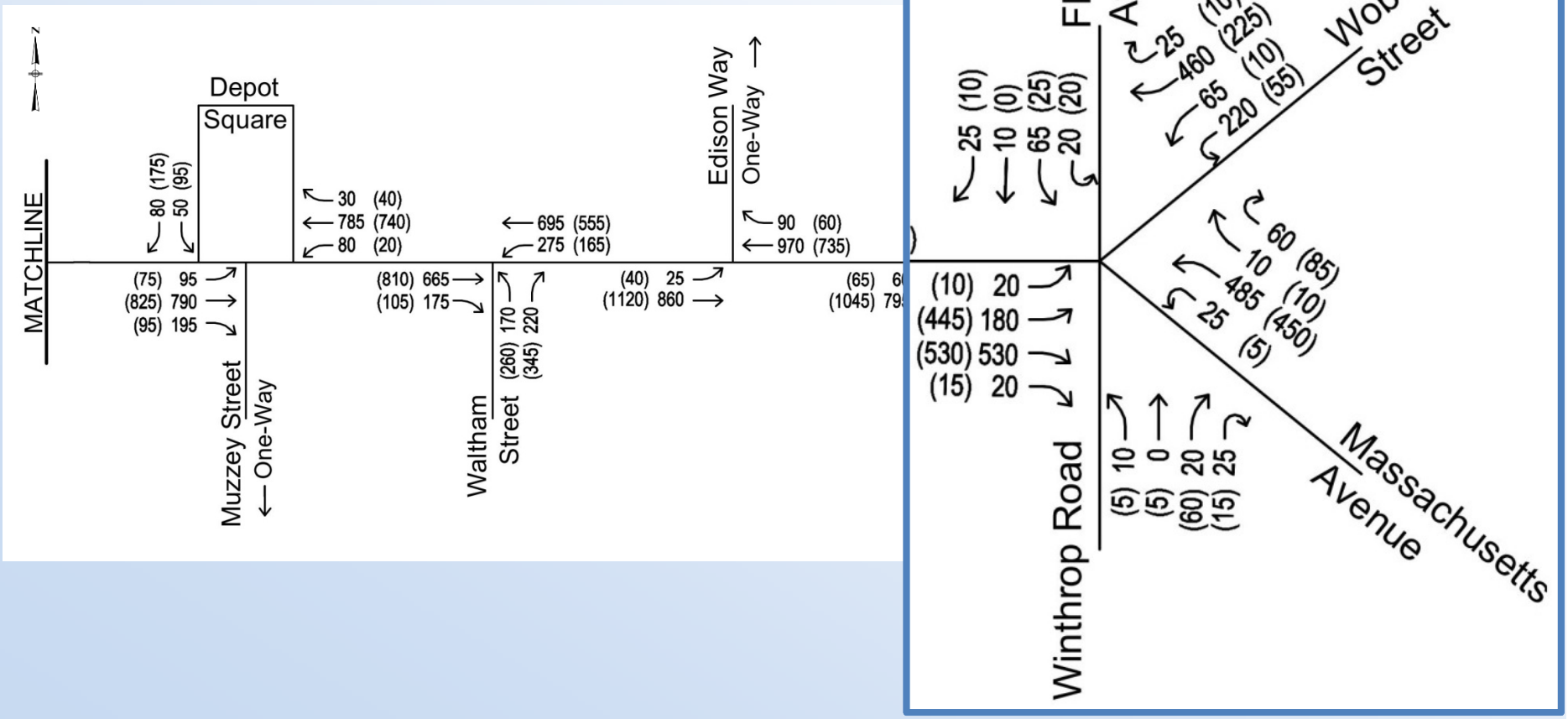
Traffic Data

1. Volume (vehicle, pedestrian, bicycle) and speed data
2. Additional volumes collected in the Winthrop Road Neighborhood
3. Special Events Observations

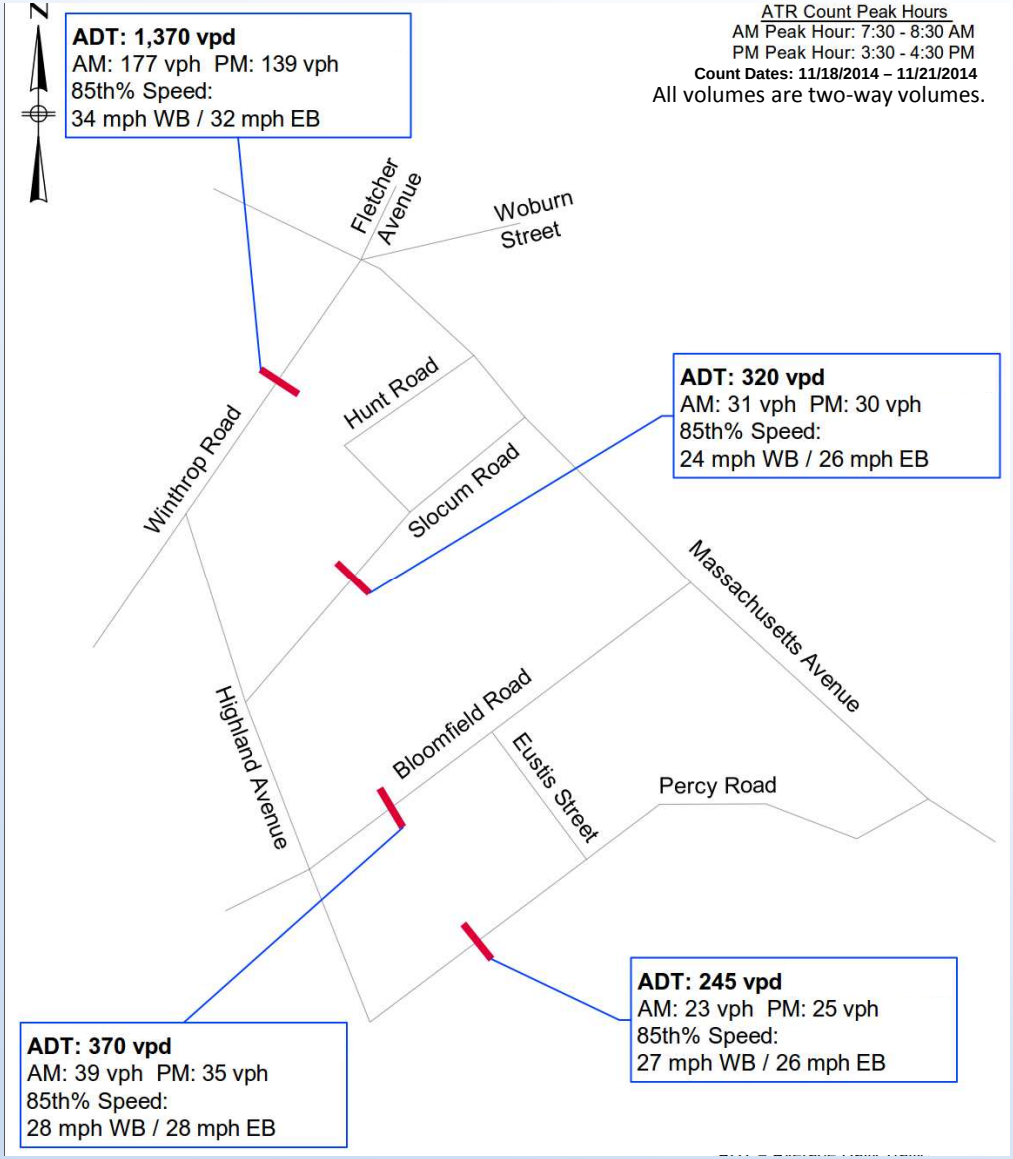
Existing Traffic Volumes



Existing Turning Movement Counts



Winthrop Road Neighborhood Traffic Volume



Intersection Crash History (2008-2010)

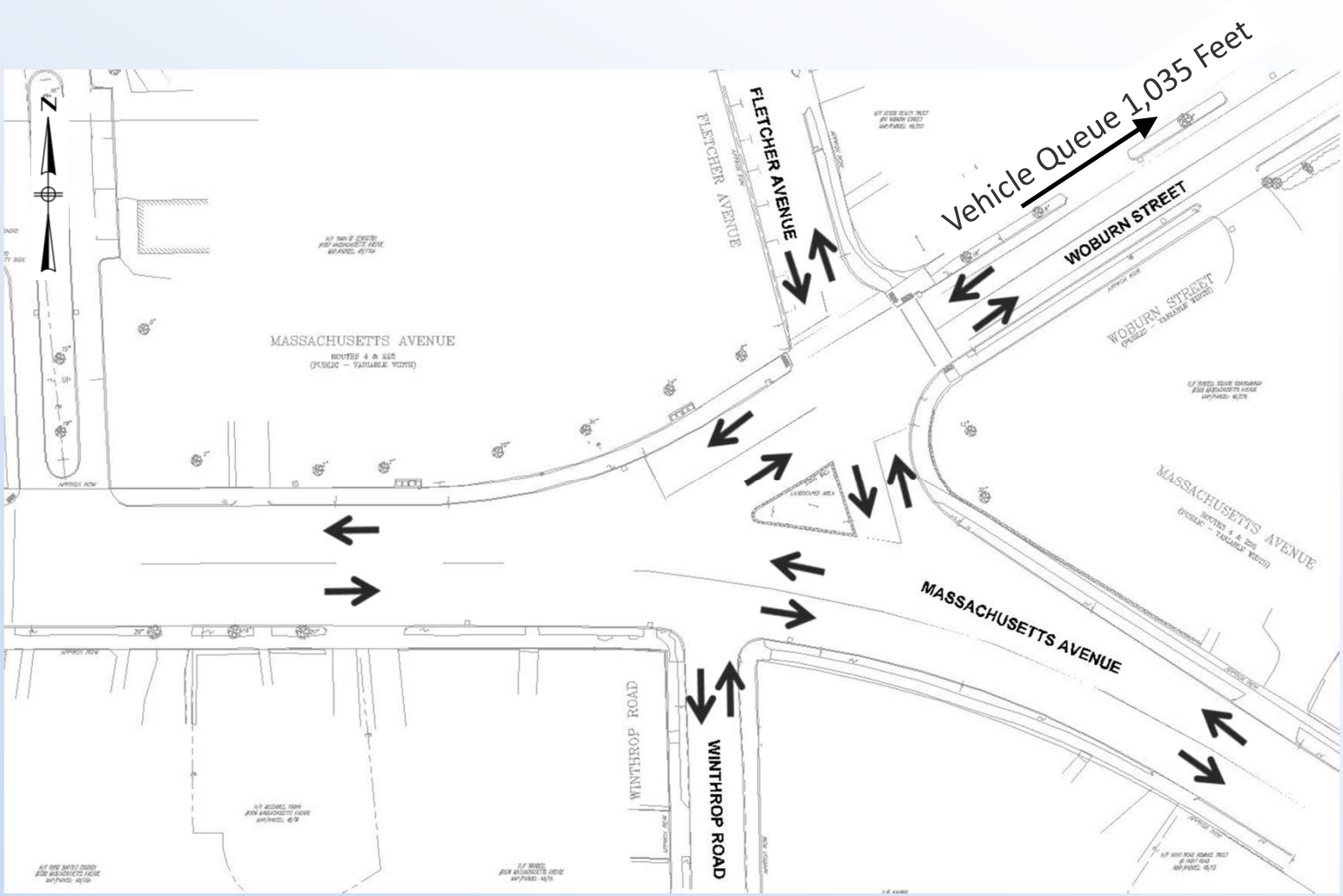
Crashes Within Entire Study Area = 196

Design Options

1. Maintain Existing Road Configuration
2. Modify Geometry, No Signal
3. Modify Geometry, Signal
4. Modify Geometry, HAWK (High-Intensity Activated CrossWalK) Signal
5. Modify Geometry, RRFB (Rectangular Rapid Flashing Beacon)
6. Roundabout
7. HAWK/RRFB at Existing Crosswalk (in front of First Baptist Church)

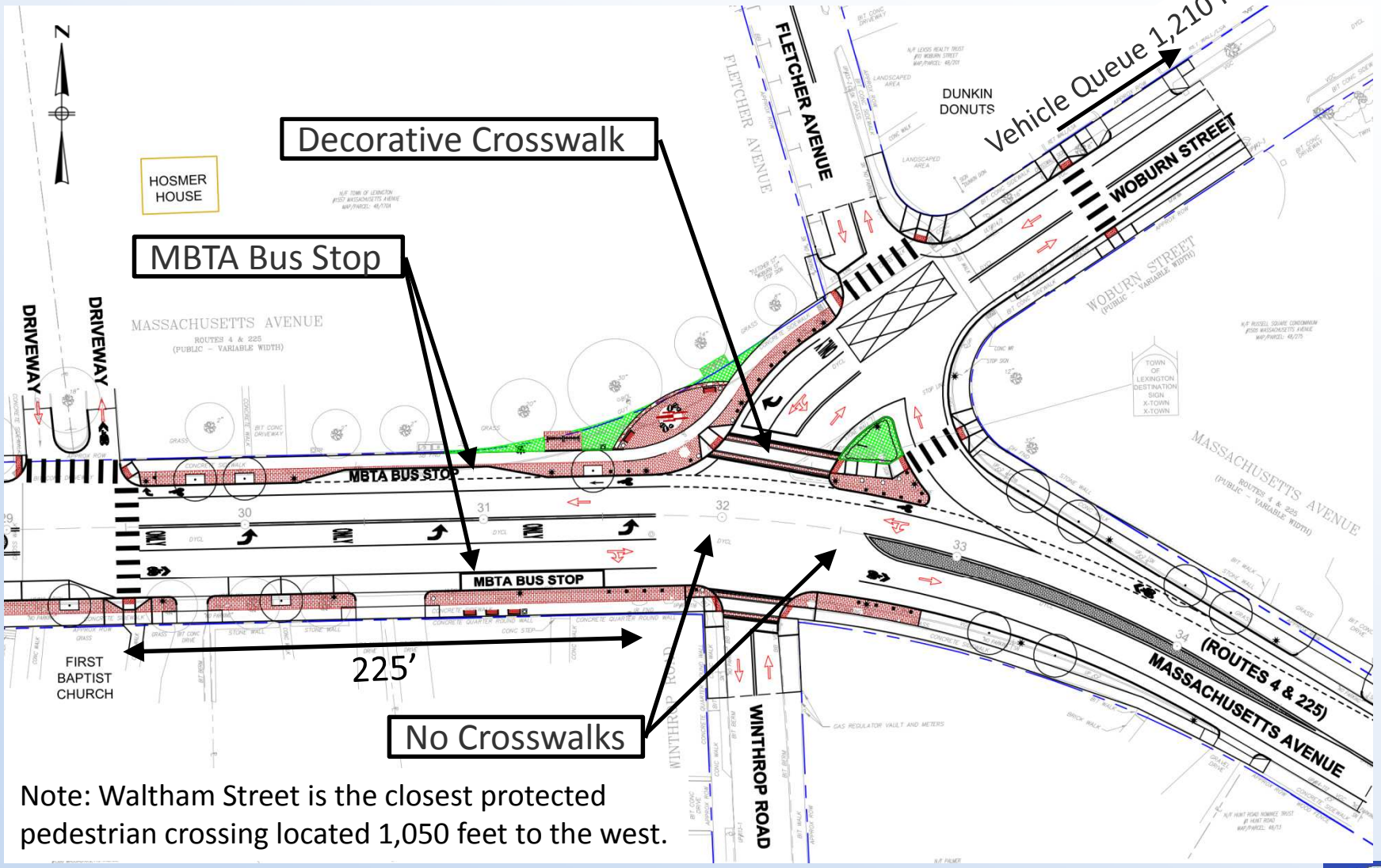
Massachusetts Avenue / Woburn Street / Winthrop Road

Option 1 – Maintain Existing Road Configuration



Massachusetts Avenue / Woburn Street / Winthrop Road

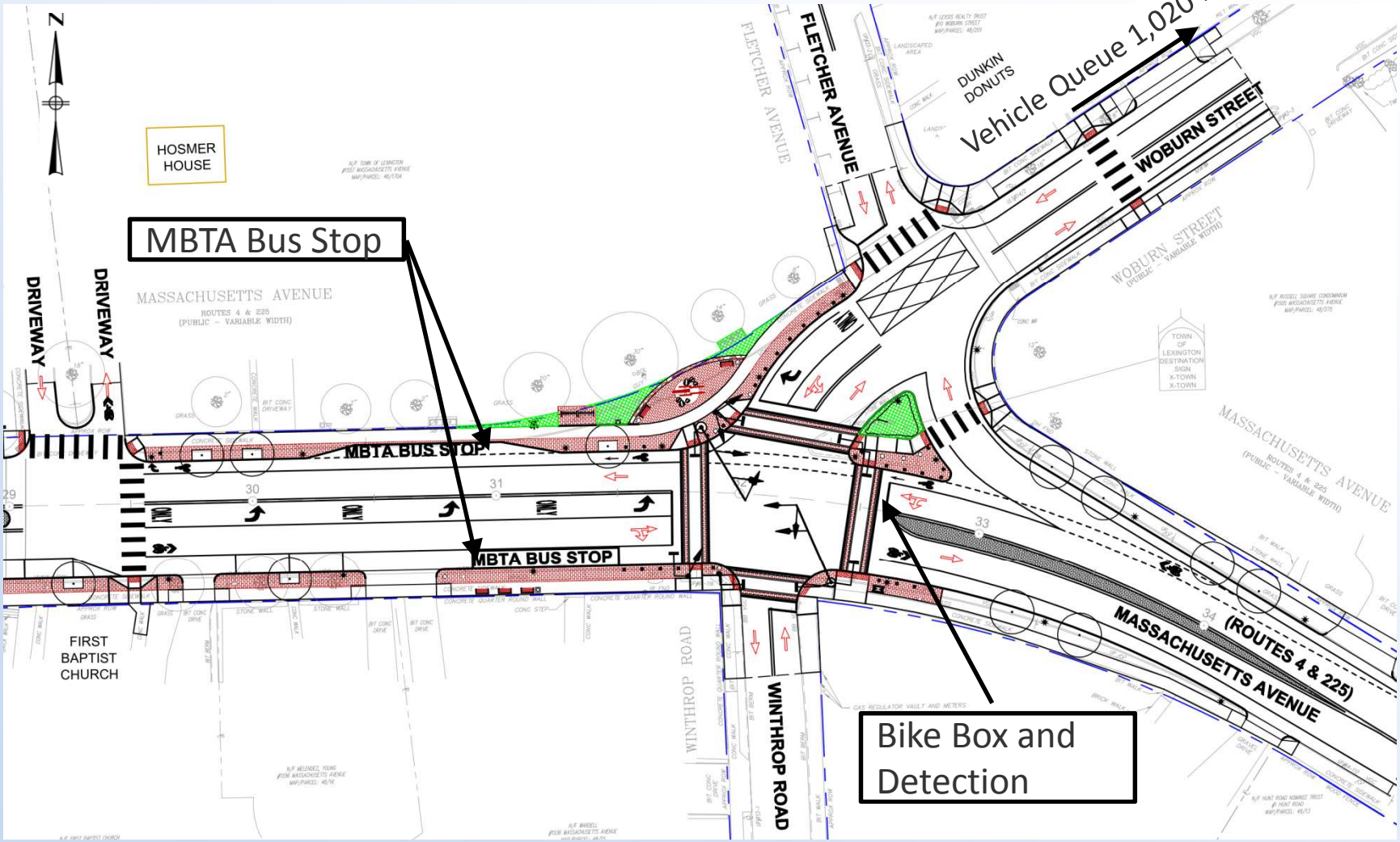
Option 2 – Modify Geometry, No Signal



Note: Waltham Street is the closest protected pedestrian crossing located 1,050 feet to the west.

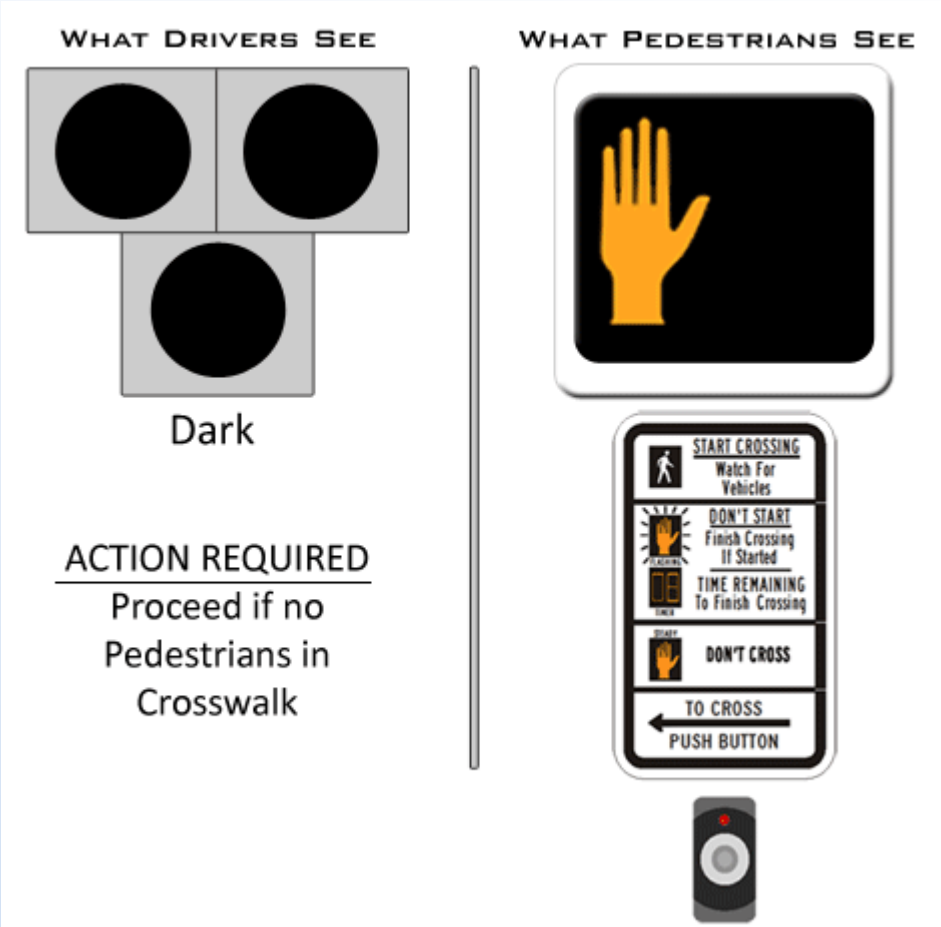
Massachusetts Avenue / Woburn Street / Winthrop Road

Option 3 - Intersection With Signal



Massachusetts Avenue / Woburn Street / Winthrop Road

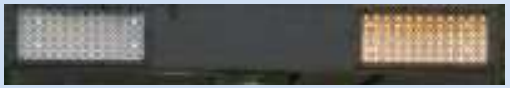
Option 4 – HAWK Signal (Not Applicable)



GIF Source: http://www.lakewood.org/HAWKsignal/

Massachusetts Avenue / Woburn Street / Winthrop Road

Option 5 – Rectangular Rapid Flashing Beacons (Not Applicable)



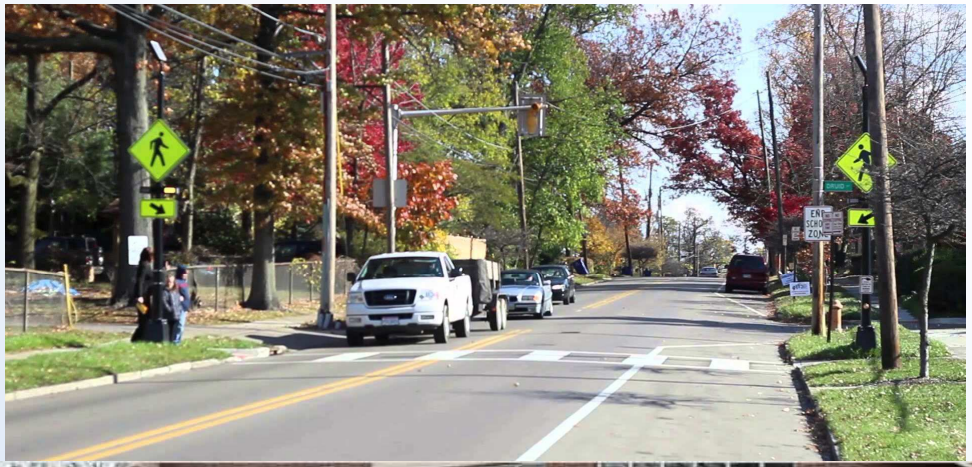
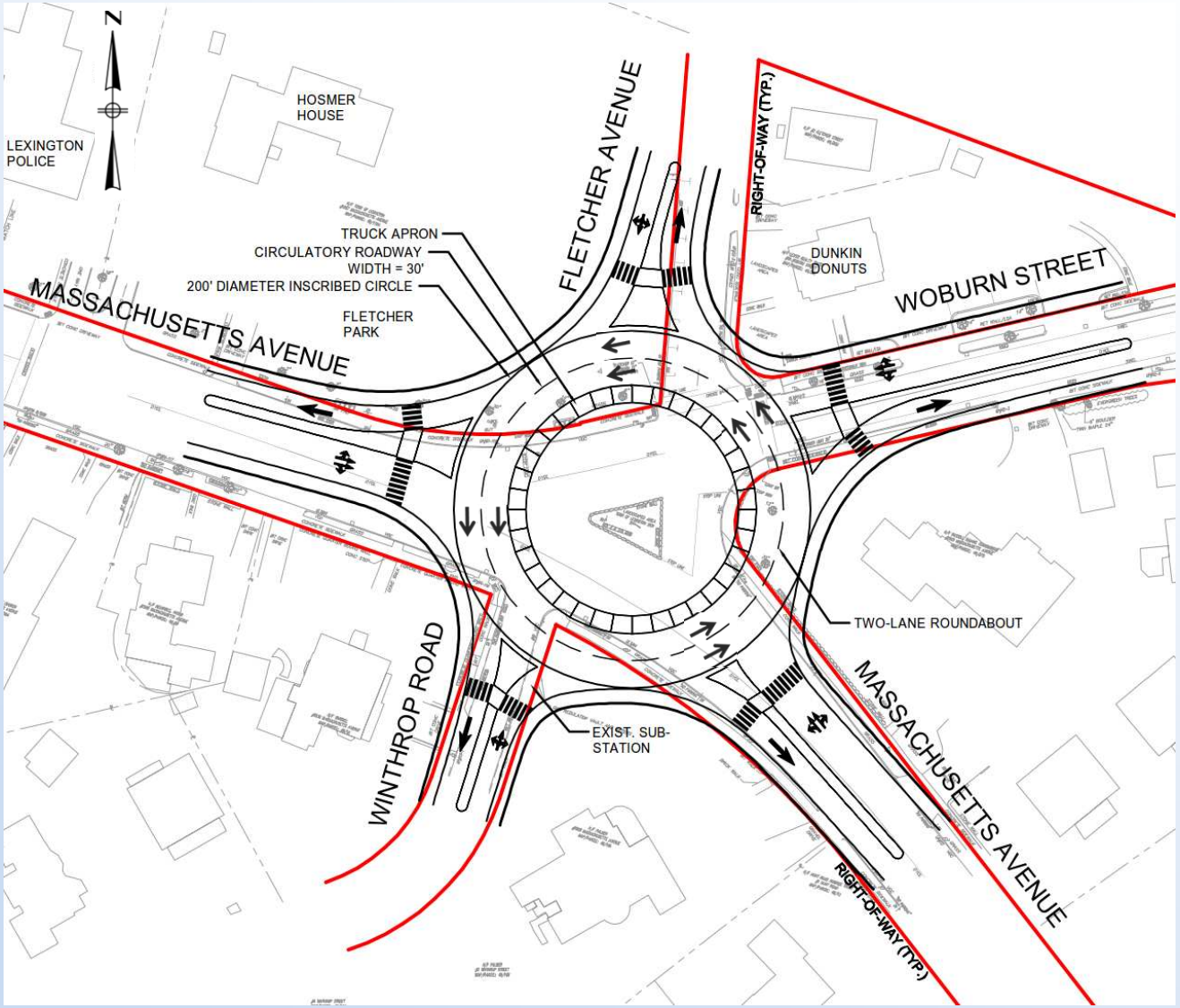


Image Source: Google

Massachusetts Avenue / Woburn Street / Winthrop Road

Option 6 - Intersection With Roundabout



Massachusetts Avenue / Woburn Street / Winthrop Road

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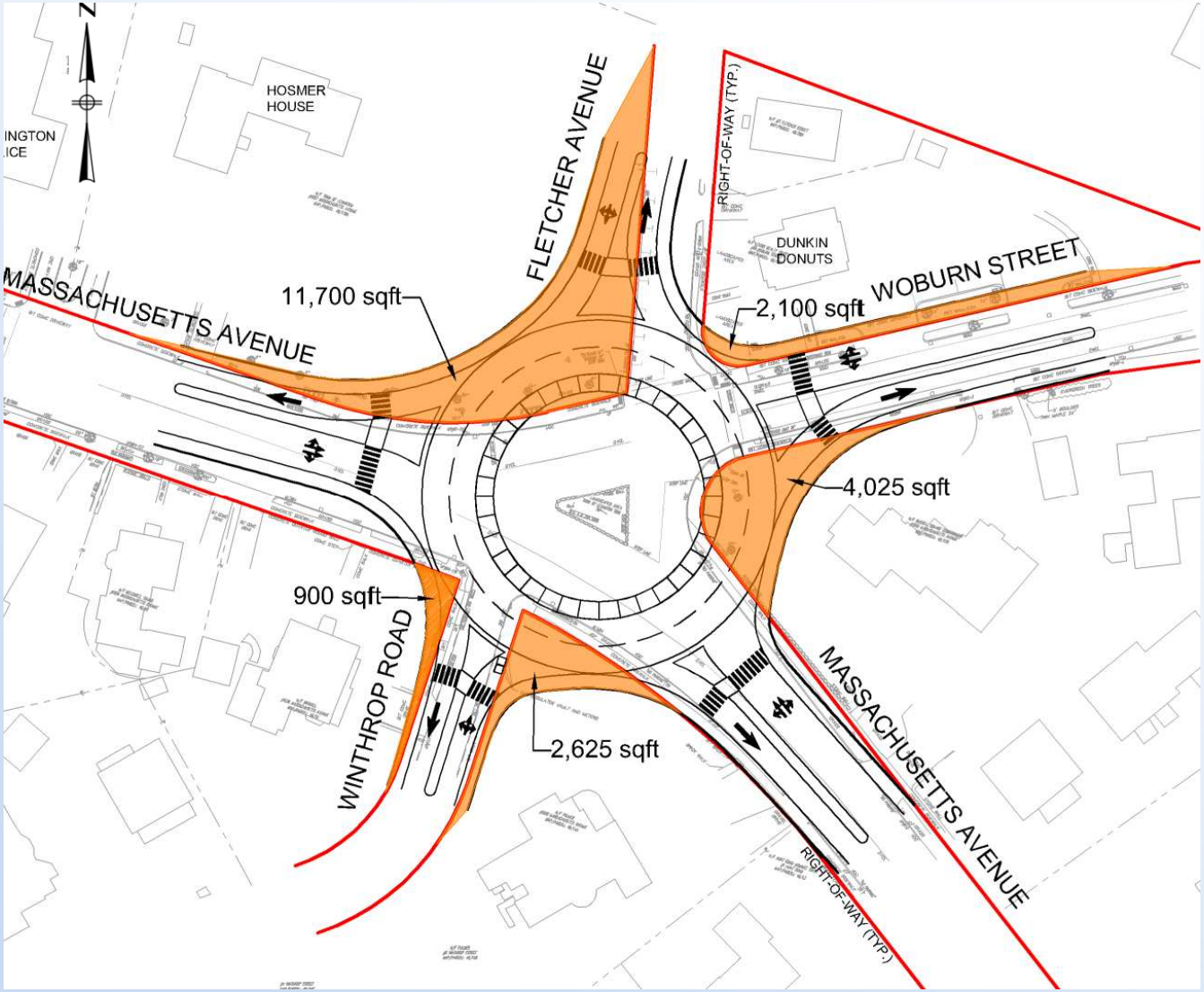


Traffic Analysis

Level of Service and Delays

Design Option	LOS	Delay (s)
Option 1: Maintain Existing Road Configuration	F	> 50 sec*
Option 2: Modify Geometry, No Signal	F	>> 50 sec*
Option 3: Modify Geometry, Signal	C	33 sec

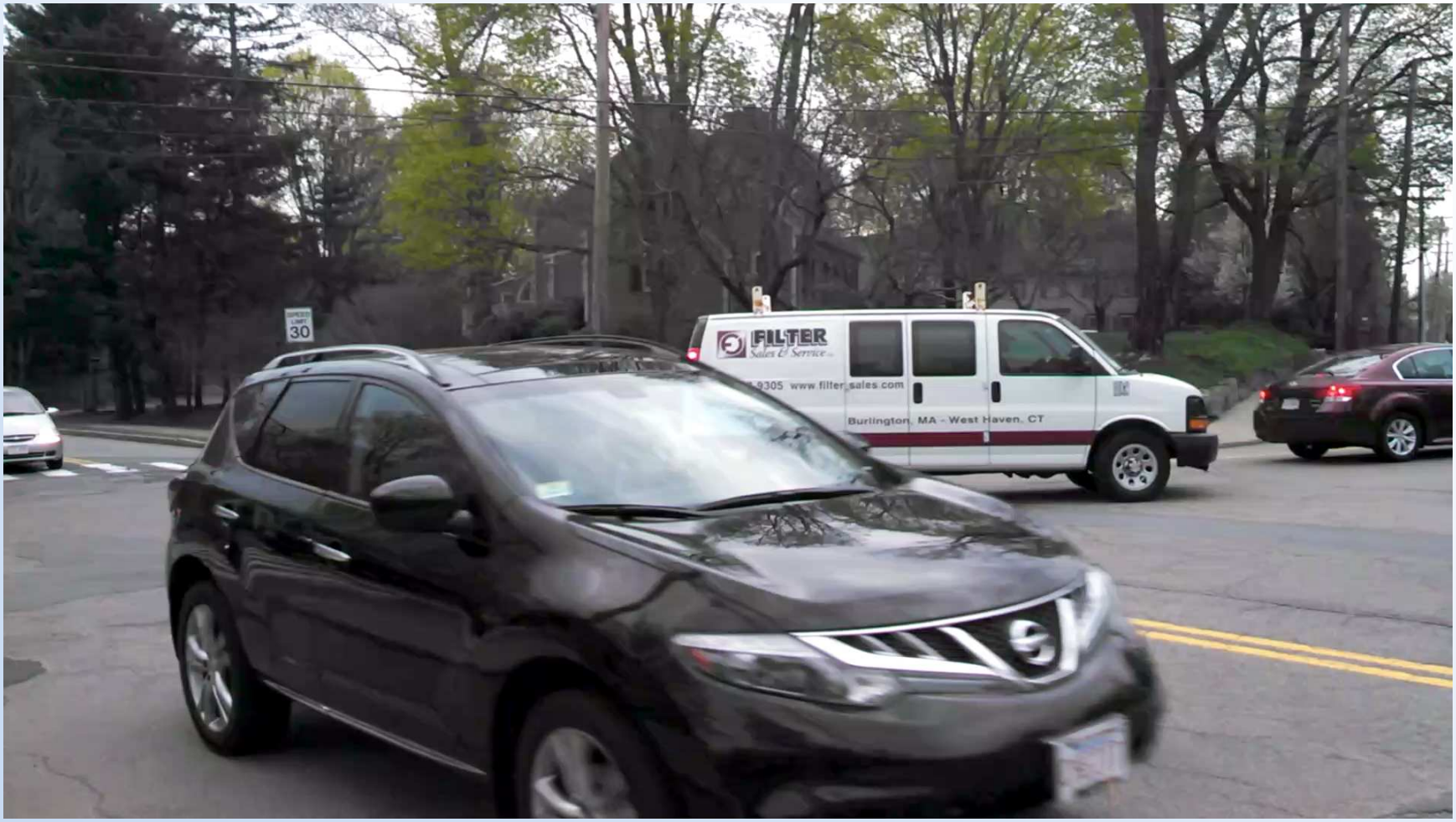
Information reflects Woburn Street approach only.
*** Approach experiences significant delay.**

Existing Woburn Street Queues At Fletcher Street

Existing Woburn Street Queues At Minuteman Crossing

Traffic Analysis

Video – Existing Queue Conditions



Video filmed during the morning peak period on Tuesday, May 5th, 2015.

Traffic Analysis

Existing Queues

Existing Queue approx. 1,035 feet to Cottage Street.

Massachusetts Avenue / Woburn Street / Winthrop Road

Design Option Comparison

Design Option	Pros	Cons
Option 1 – Maintain Existing Road Configuration	• Maintains existing traffic movements • Maintains the existing island	• Unsafe traffic patterns • No pedestrian or bicycle accommodation • Sight line restrictions • Queuing on Woburn Street (1,035 feet) • Poor Operation (LOS F) • Appearance/expansive pavement • No protection for bus stop pedestrians
Option 2 – Modify Geometry, No Signal	• Limited pedestrian accommodation • Bicycle accommodations • Improved traffic patterns/ channelization • Sight line improvements • Traffic Calming	• Pedestrian crosswalk unprotected • No protection for bus stop pedestrians • Increased traffic queues on Woburn Street (1,210 feet) • Poor operation (LOSF)
Option 3 – Modify Geometry, Traffic Signal	• Enhanced gateway to Town Center • Protected full pedestrian/bicycle accommodations • Meets MUTCD Warrants • Improved traffic safety/operations • Protects bus stop pedestrian traffic • Traffic calming benefits • Manage Mass. Ave. Traffic • Manage Winthrop Road traffic	• Installation and maintenance of traffic signals • Queuing on Woburn Street (1,020 feet)

MUTCD – Manual on Uniform Traffic Control Devices.

Massachusetts Avenue / Woburn Street / Winthrop Road

Design Option Comparison

Design Option	Pros	Cons
Option 4 – Modify Geometry, HAWK Signal	• Not Applicable	• Not Applicable • Does not meet MUTCD warrants • Recommended for mid-block crossings only
Option 5 – Modify Geometry, RRFB	• Not Applicable	• Not Applicable • MUTCD prohibits use of RRFB's at crosswalks controlled by YIELD signs, STOP signs, or traffic signals. Roundabouts are exempt.
Option 6 – Roundabout	• Controls traffic without the use of traffic signals	• Requires extensive Right-of-Way • Volume requires a 2-Lane roundabout • Topographical issues
Option 7 – HAWK/RRFB at Existing Crosswalk	• Possible/Not Recommended	• Not Applicable • Close proximity (225') to the intersection • Passive Protection • Lack of on-demand coordination for vehicles

MUTCD – Manual on Uniform Traffic Control Devices.

Massachusetts Avenue / Woburn Street / Winthrop Road

Viable Design Option Comparison Summary

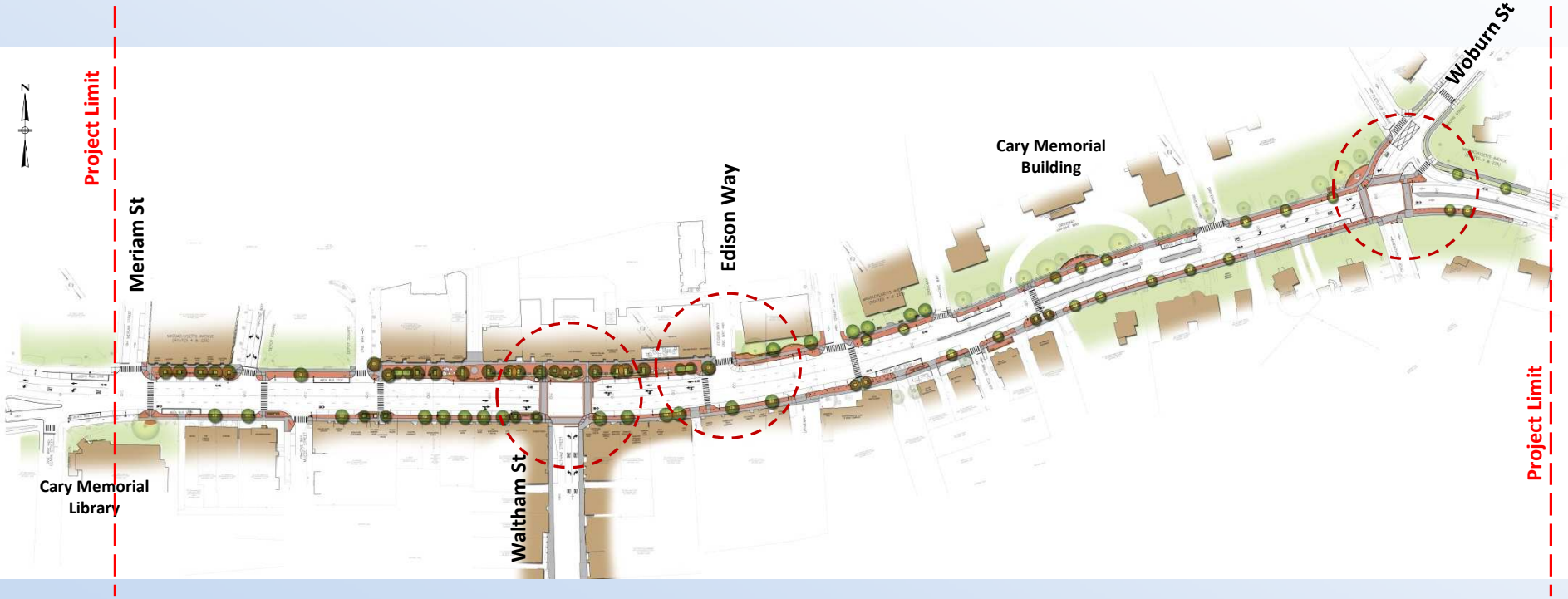
Design Option	Option 1 (Maintain Existing Road Configuration)	Option 2 (Modify Geometry, No Signal)	Option 3 (Modify Geometry, Traffic Signal)
1. Overall Safety	-	+	+ +
2. Pedestrian Crossing	-	+	+ +
3. Traffic Calming	-	+	+ +
4. Level of Operation (Delays/ LOS)	-	- -	+
5. Appearance	-	+ +	+
6. Gateway	-	+	+ +
7. Winthrop Rd.	-	+	+
8. Bicycle Accommodation	-	- -	+

Legend

- Negative
+ Positive

Note: Options 4, 5, 6, and 7 are not viable.

Intersection Locations



Massachusetts Avenue / Edison Way

Mass Ave. Westbound Right Turn Lane Removal

- Maintain overall traffic operational LOS
- Pedestrian Safety (Bump-outs)
  - Shorter crosswalks
  - Wider sidewalk
  - Better sightlines
- Bicycle Accommodation
  - Shared use lane
- Provide Traffic Calming
  - Slow turning vehicle speed
- Parking management flexibility

Massachusetts Avenue / Waltham Street

Mass Ave Eastbound Right Turn Lane Removal

- Maintain overall traffic operational LOS
- Pedestrian Safety (Bump-outs)
  - Shorter crosswalks
  - Wider sidewalk
  - Better sightlines
- Bicycle Accommodation
  - Shared use lane
- Provide Traffic Calming
  - Slow turning vehicle speed
- Parking management flexibility

Next Step

- June 10th Public Meeting